KINGDOM OF SAUDI ARABIA
AL-IMAM MUHAMMAD BIN SAUD
ISLAMIC UNIVERSITY
FACULTY OF SCIENCES
DEPARTMENT OF PHYSICS

المملكة العربية السعودية
جامعة الإمام محمد بن سعود الإسلامية
كلية العلوم
قسم الفيزياء

Level Four

Introduction to Linear Algebra

Course Code	Course Num.	Course Name	Credit Hours	Lec	Lab	Tut	Prerequisites
MAT	221	Intr. Linear Algebra	3	2	0	2	MAT 251

Objectives:

- To introduce students to the subject of linear algebra ,this is essential for subsequent courses in mathematics and physical science.
- To let students be familiar with basics of matrix theory.
- To let students be familiar with basics of vector spaces and linear transformations.

Syllabus:

- Matrices: elementary row operations, transpose of a matrix, inverse of a square matrix, linear equation systems and Gauss eliminations, determinants and their properties, classical adjoint; Cramer's rule.
- Vectors in R^2 and R^3: Dot product, projections, cross product, mixed product.
- Vector spaces: Basic definitions, subspaces, linear dependence and independence, bases and dimensions, inner product spaces and Gram-Schmidt normalization.
- Eigenvalues: Eigenvalues and eigenvectors, characteristic polynomial.
- Numerical solution of linear systems: Gaussian elimination, and LU decomposition.

The instructor should stress on using mathematical software through out the course.

References:

- Linear Algebra, M.Lipson, Schaum's Outline, S. Lipschutz, McGraw-Hill 3rd ed. (2000).
- Linear Algebra, S. Leduc, Cliffs Notes (1996).